

(12) UK Patent Application (19) GB (11) 2 251 357 (13) A

(43) Date of A publication 01.07.1992

(21) Application No 9121435.3

(22) Date of filing 08.10.1991

(30) Priority data

(31) 02273980

(32) 11.10.1990

(33) JP

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(51) INT CL⁵

H04Q 7/04, H04M 1/274

(52) UK CL (Edition K)

H4K KBNJ KYX

(56) Documents cited

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(58) Field of search

UK CL (Edition K) H4K KBNA KBNJ KYR KYX

INT CL⁵ H04M, H04Q

(54) Radiotelephone terminal

(57) A radiotelephone terminal comprises a terminal unit (31) having a transmitter-receiver and an external device (43) provided separately from the terminal unit. Each of the terminal unit (31) and the external device (43) has an input unit (35, 44) for inputting subscriber information, a storage unit (36, 46) for storing the subscriber information, a recalling unit (37, 47) for selectively recalling the stored information, and a radio transmitting unit (39) for transmitting subscriber information. Further, a transfer unit (52) is provided to recall the content of storage and to transfer the recalled information between the terminal unit (31) and the external device (43) so as to make it possible to mutually rewrite the subscriber information stored in the storage unit (36, 46) of the radiotelephone terminal unit (31) and the external device (43) respectively. The terminal unit (31) and the external device (43) can be used in either an integrated state or a separately independent state.

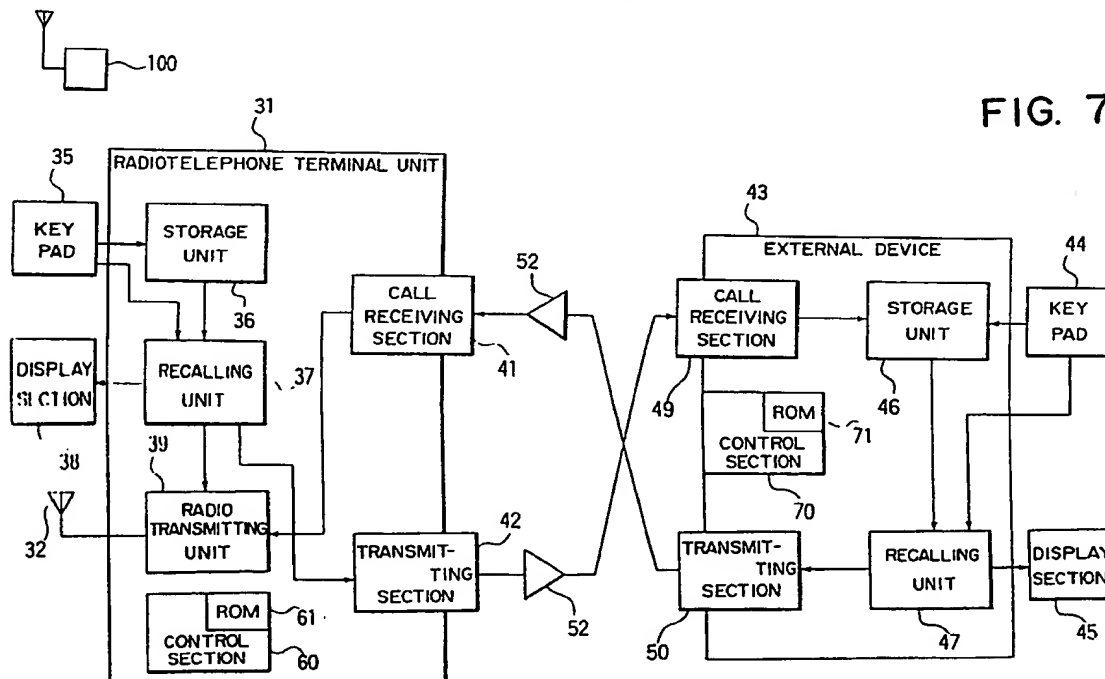
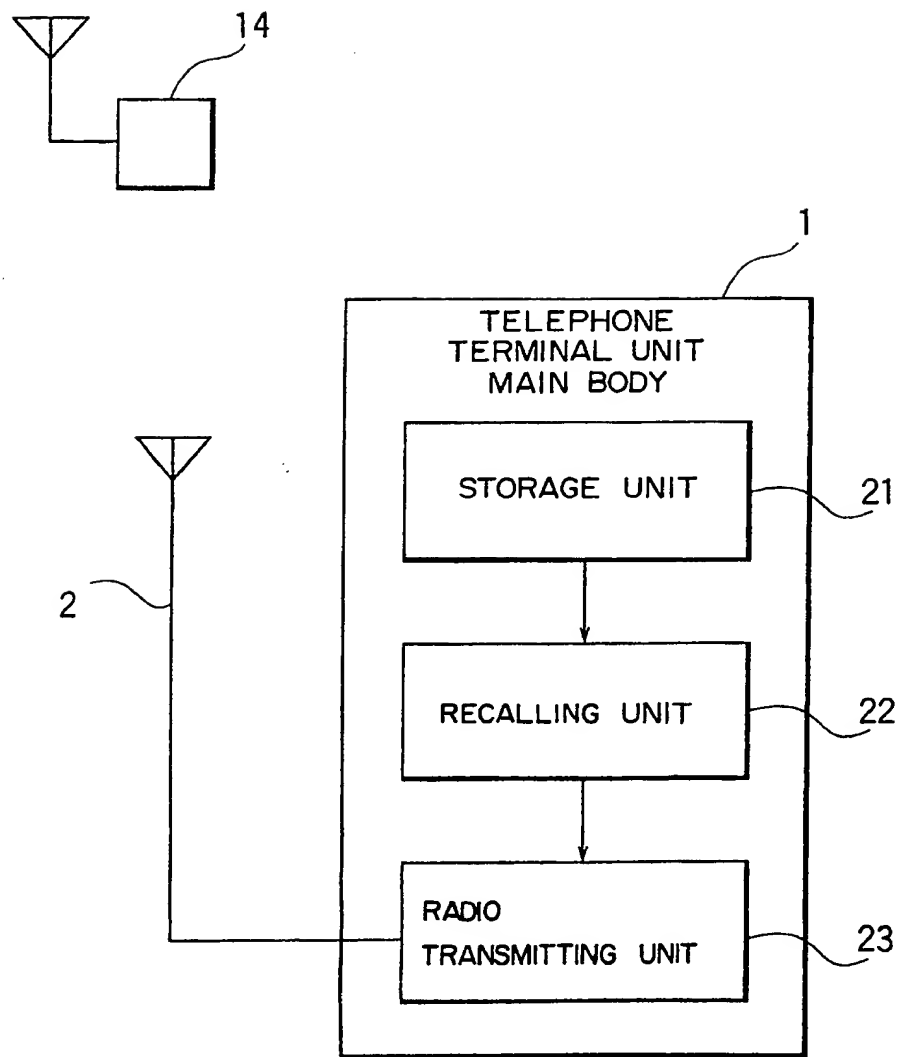


FIG. 7

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

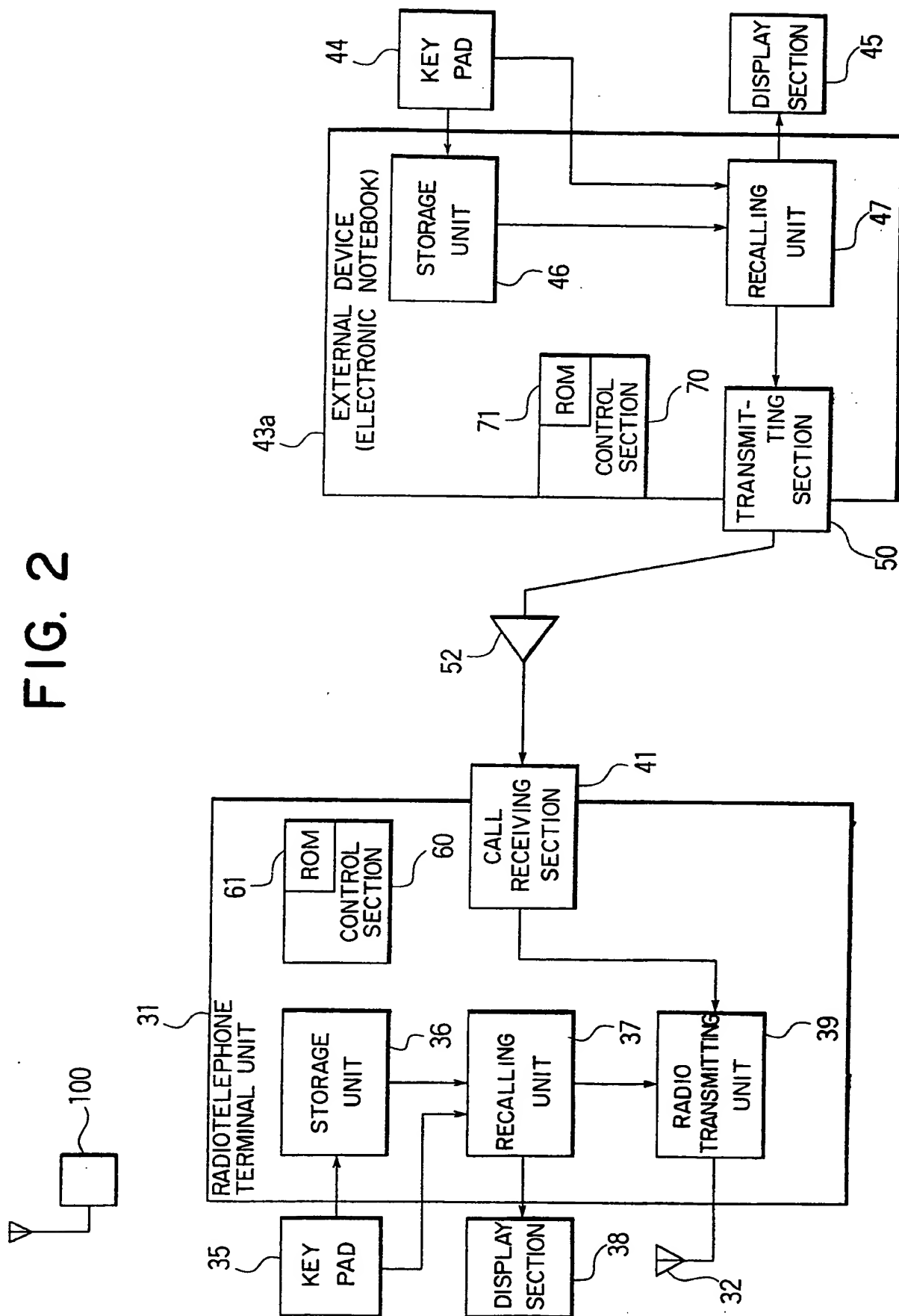
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FIG. 1
(PRIOR ART)



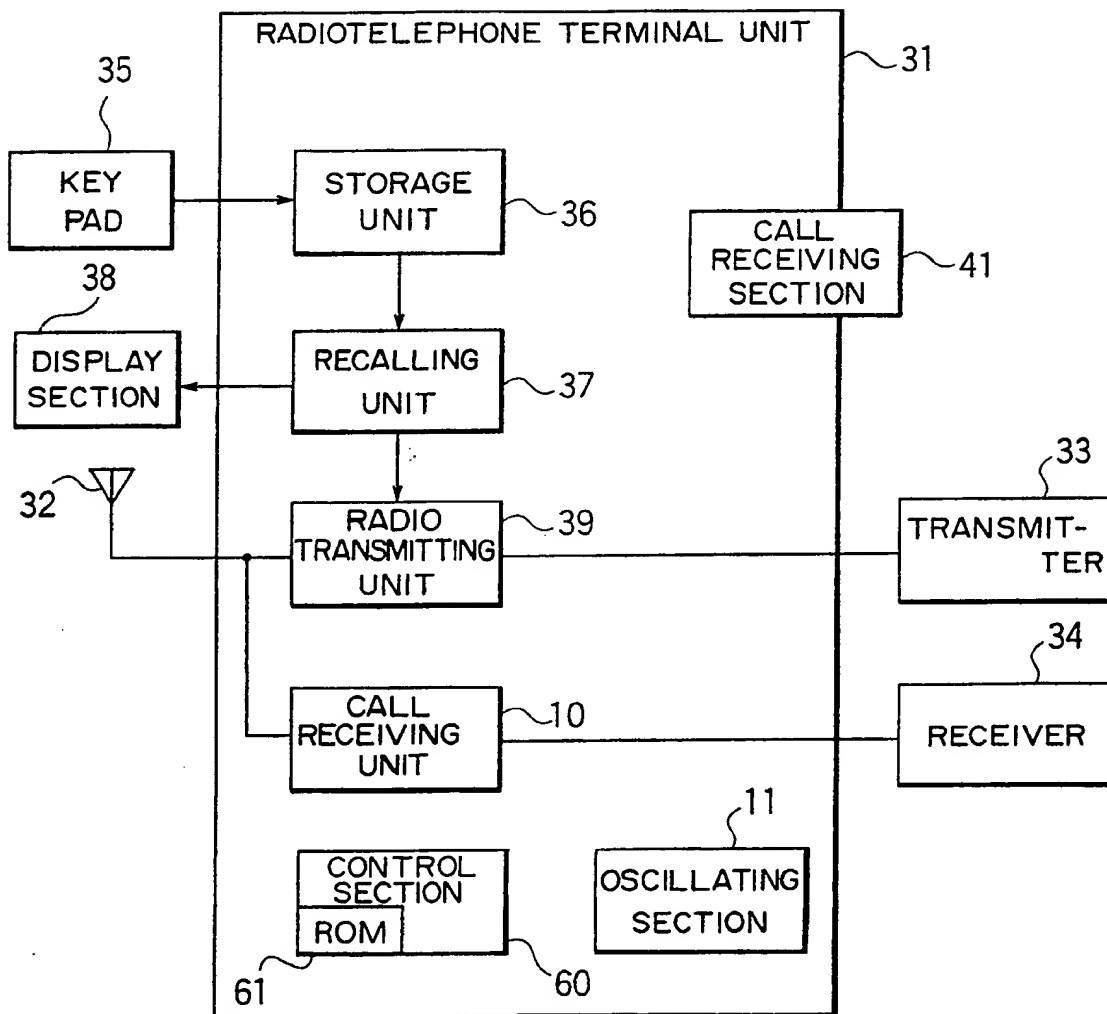
2/17

FIG. 2



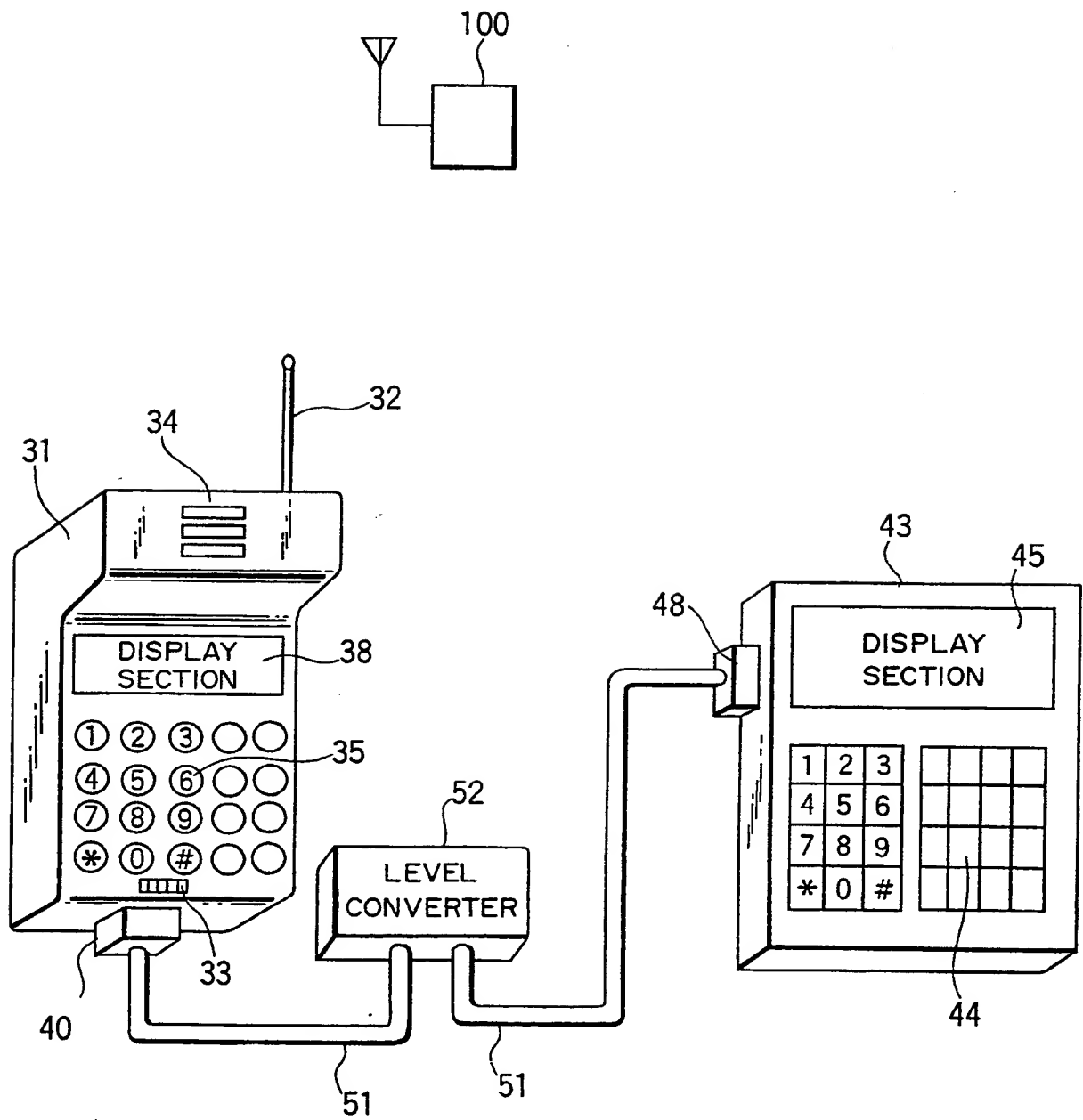
3/17

FIG. 3



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FIG. 4



5/17

FIG. 5

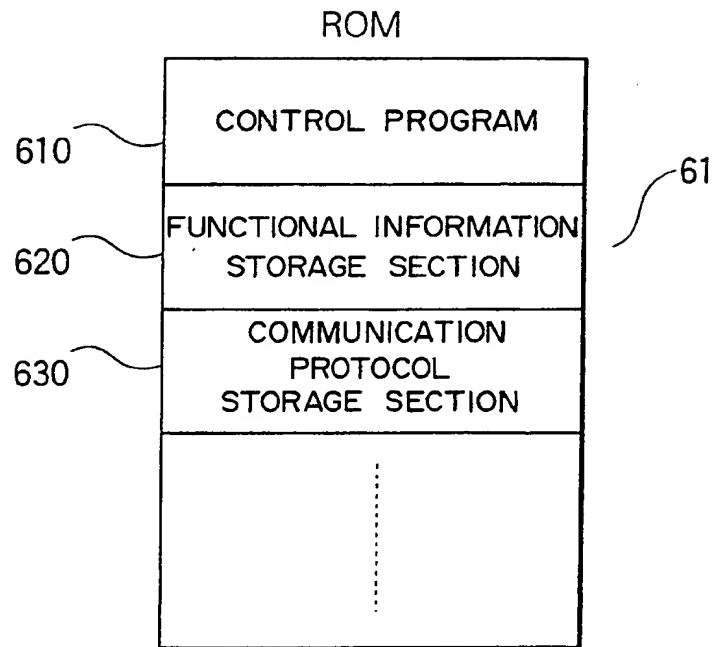
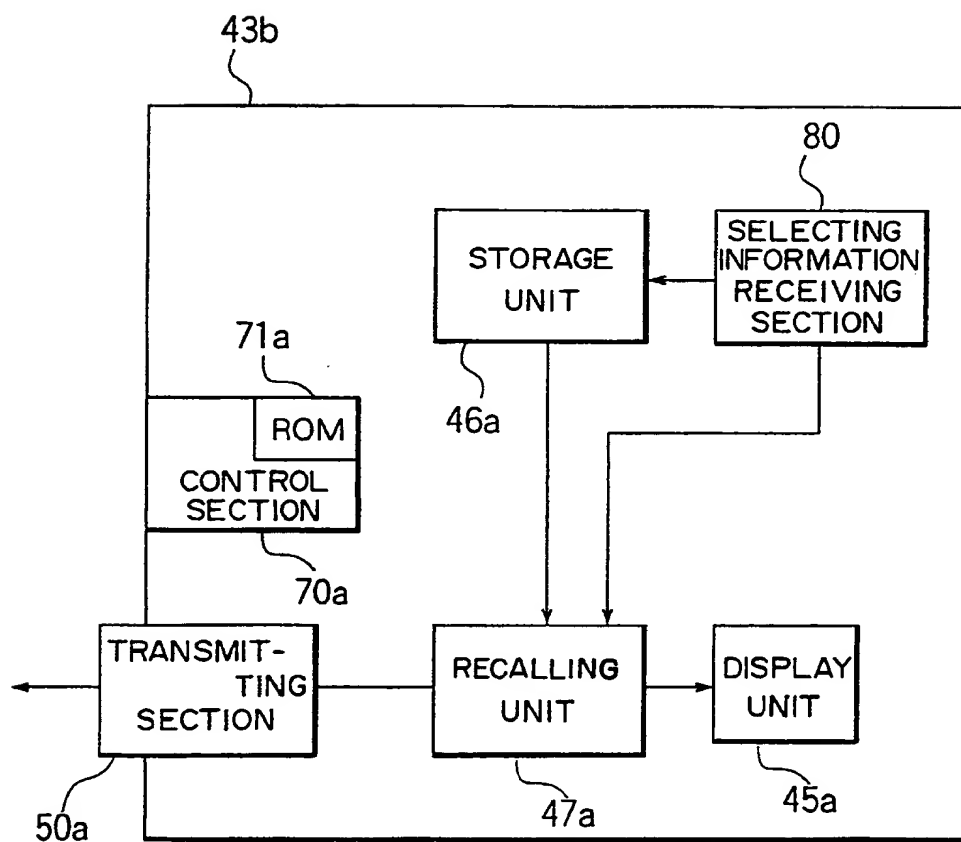


FIG. 6



7/17

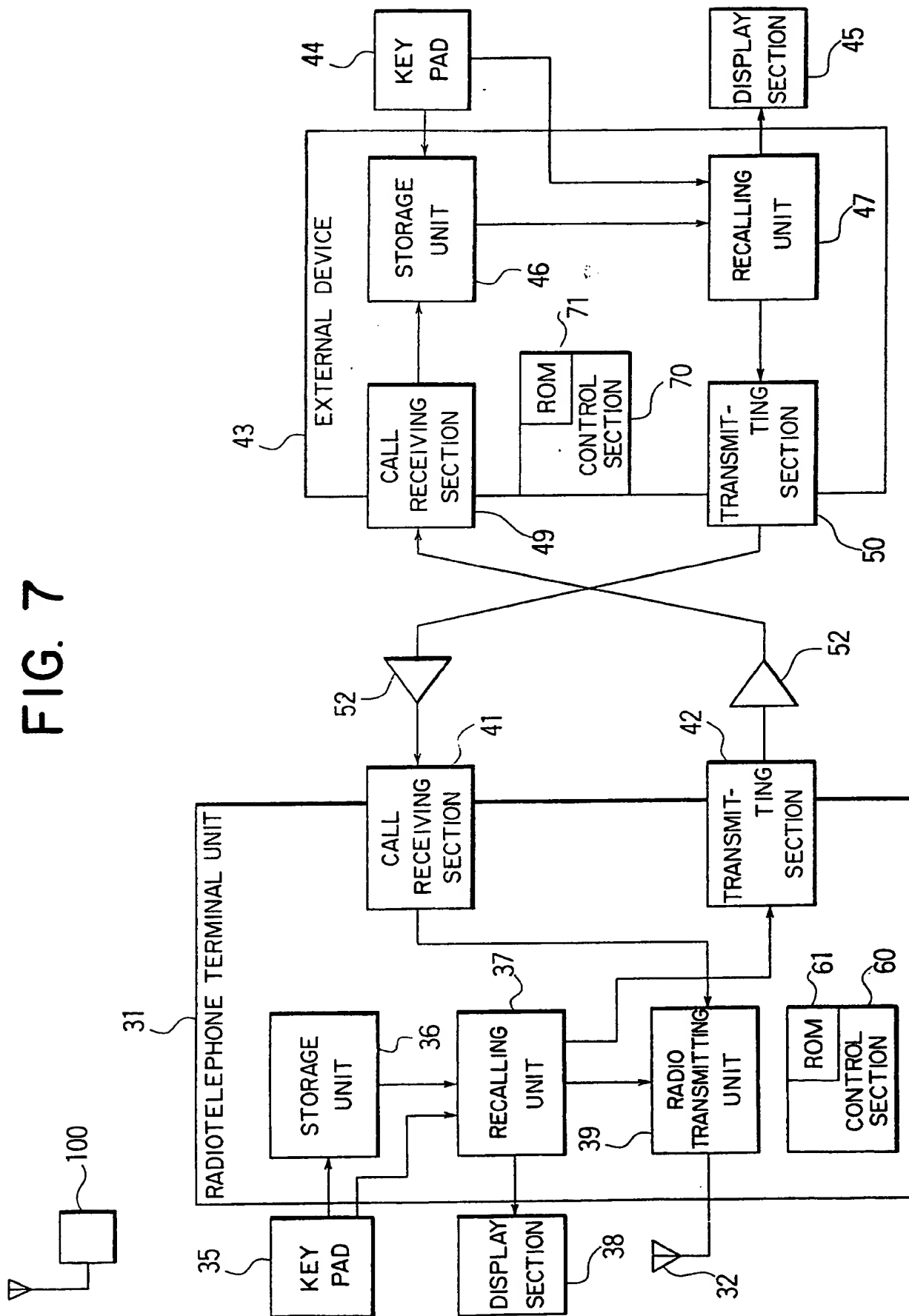


FIG. 8A

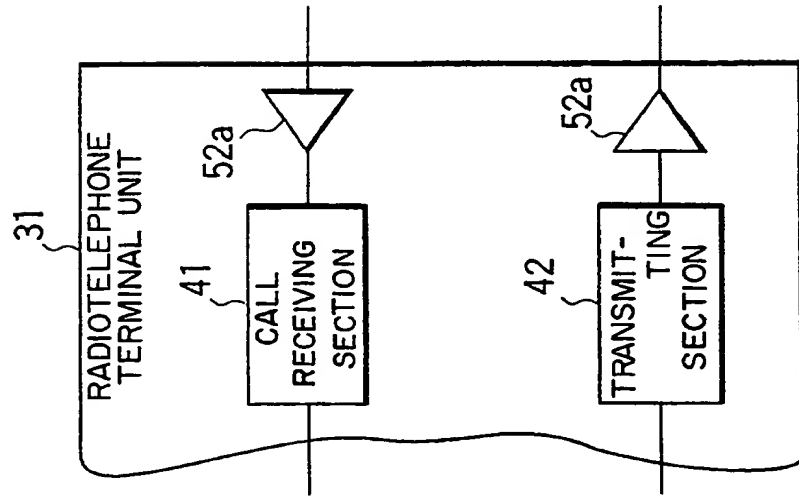
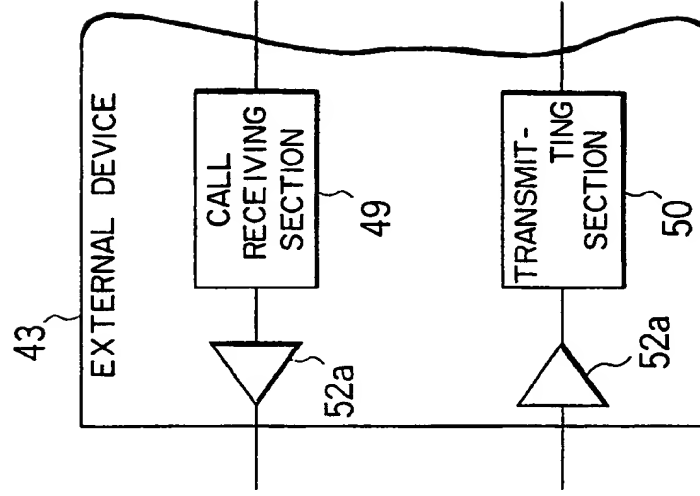
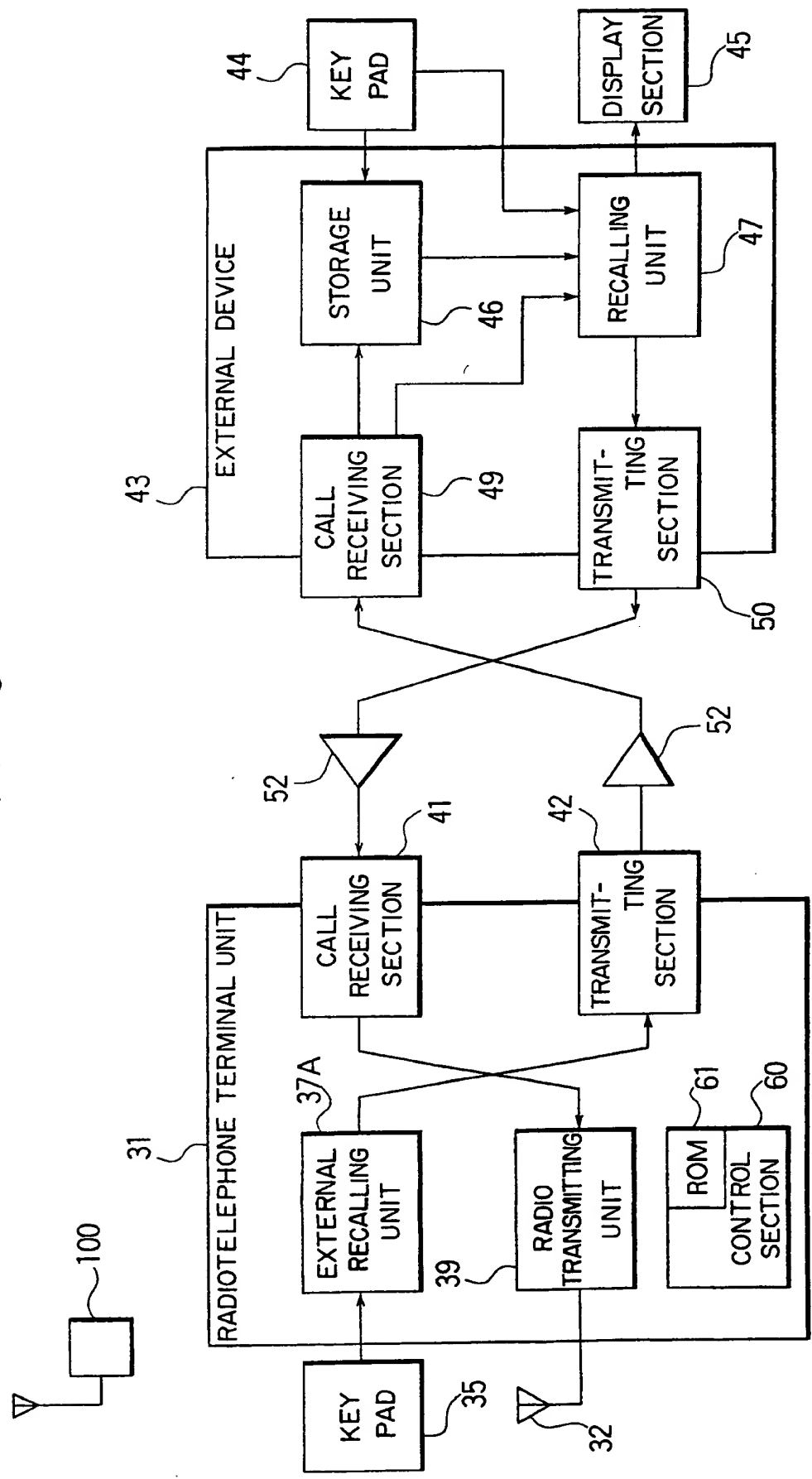


FIG. 8B

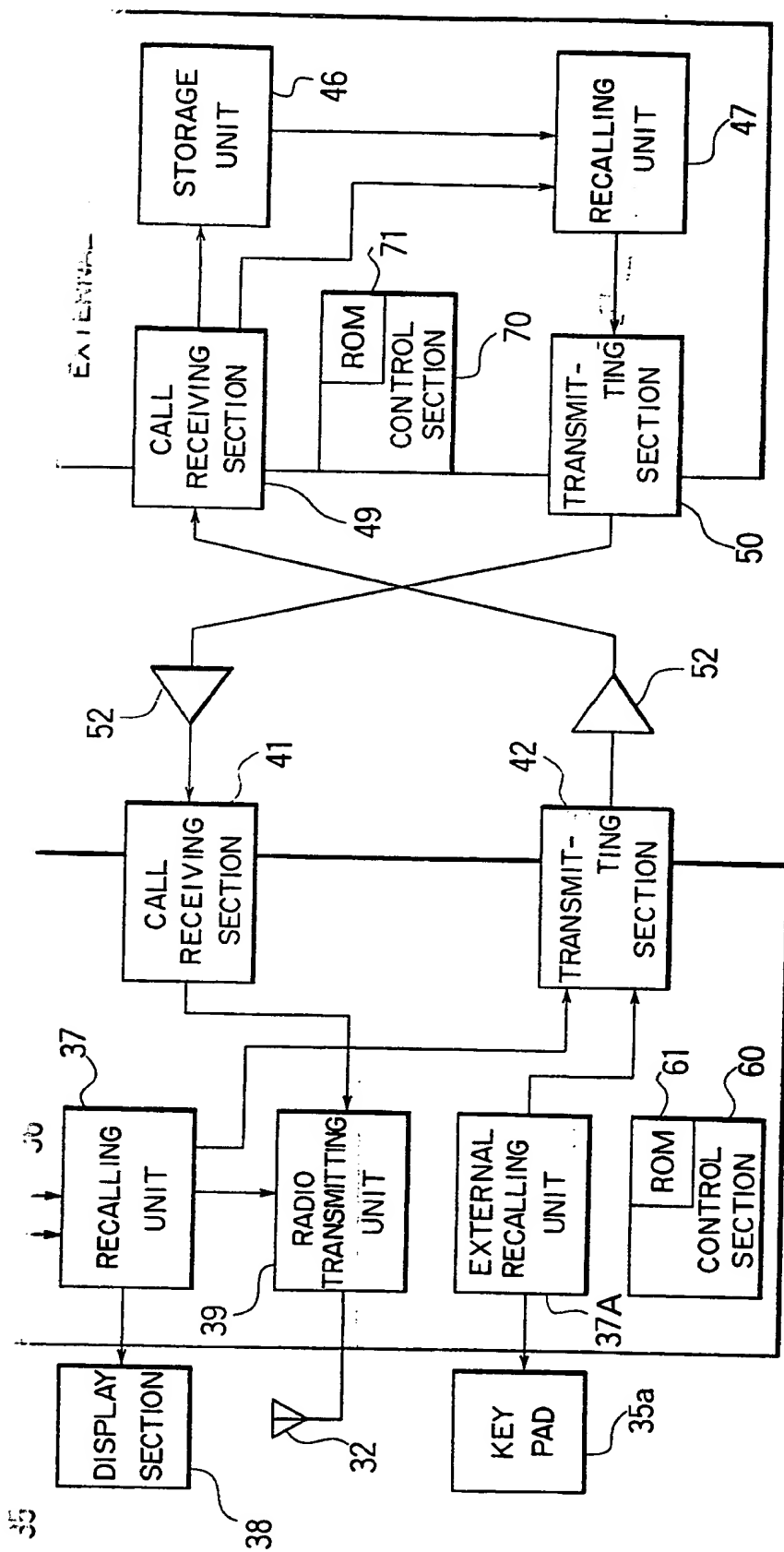


9/17

FIG. 9



10/17



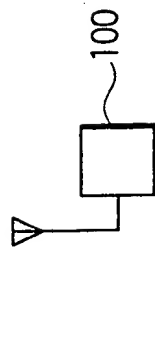
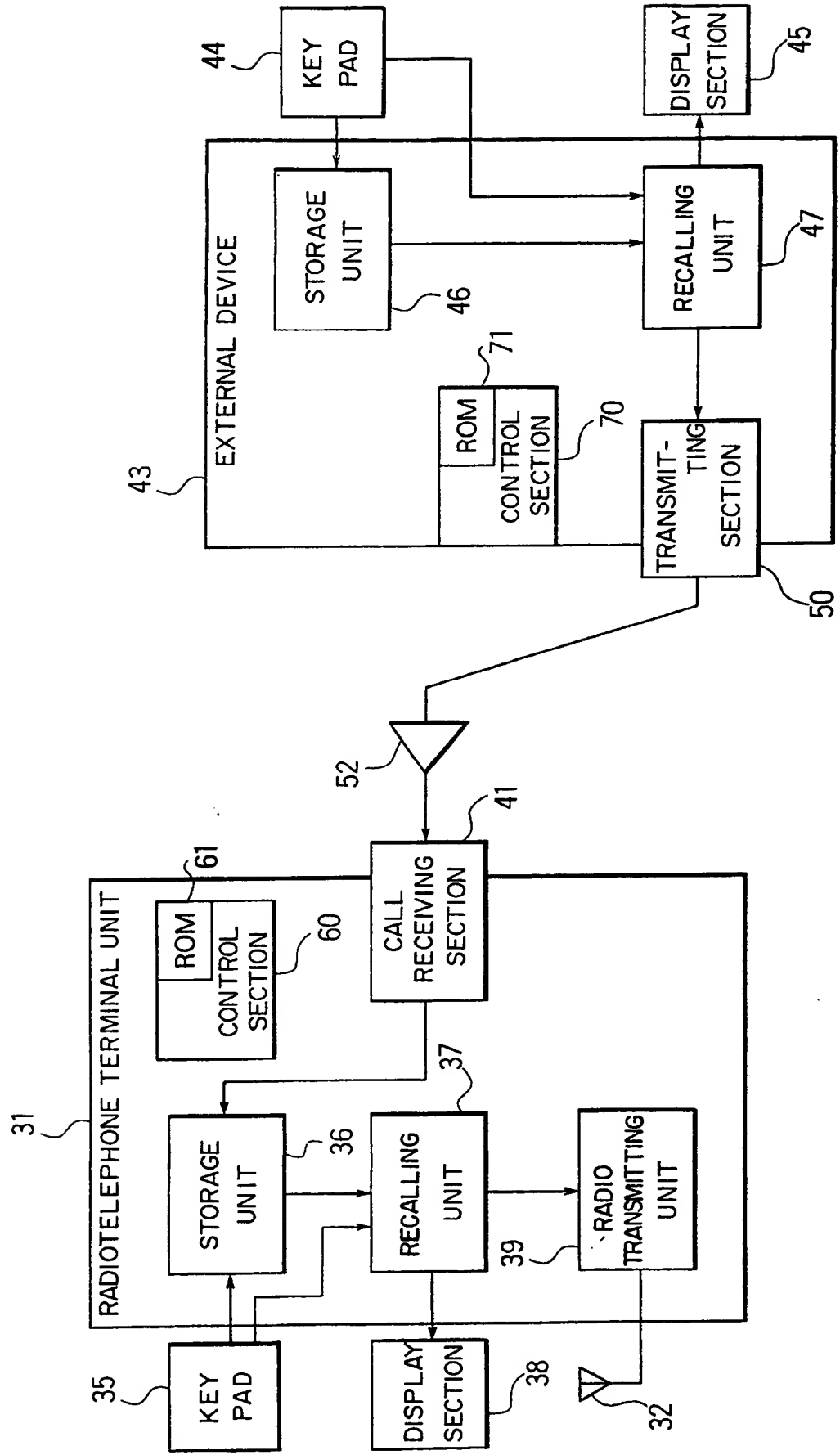


FIG. 11



11/17

12/17

FIG. 12

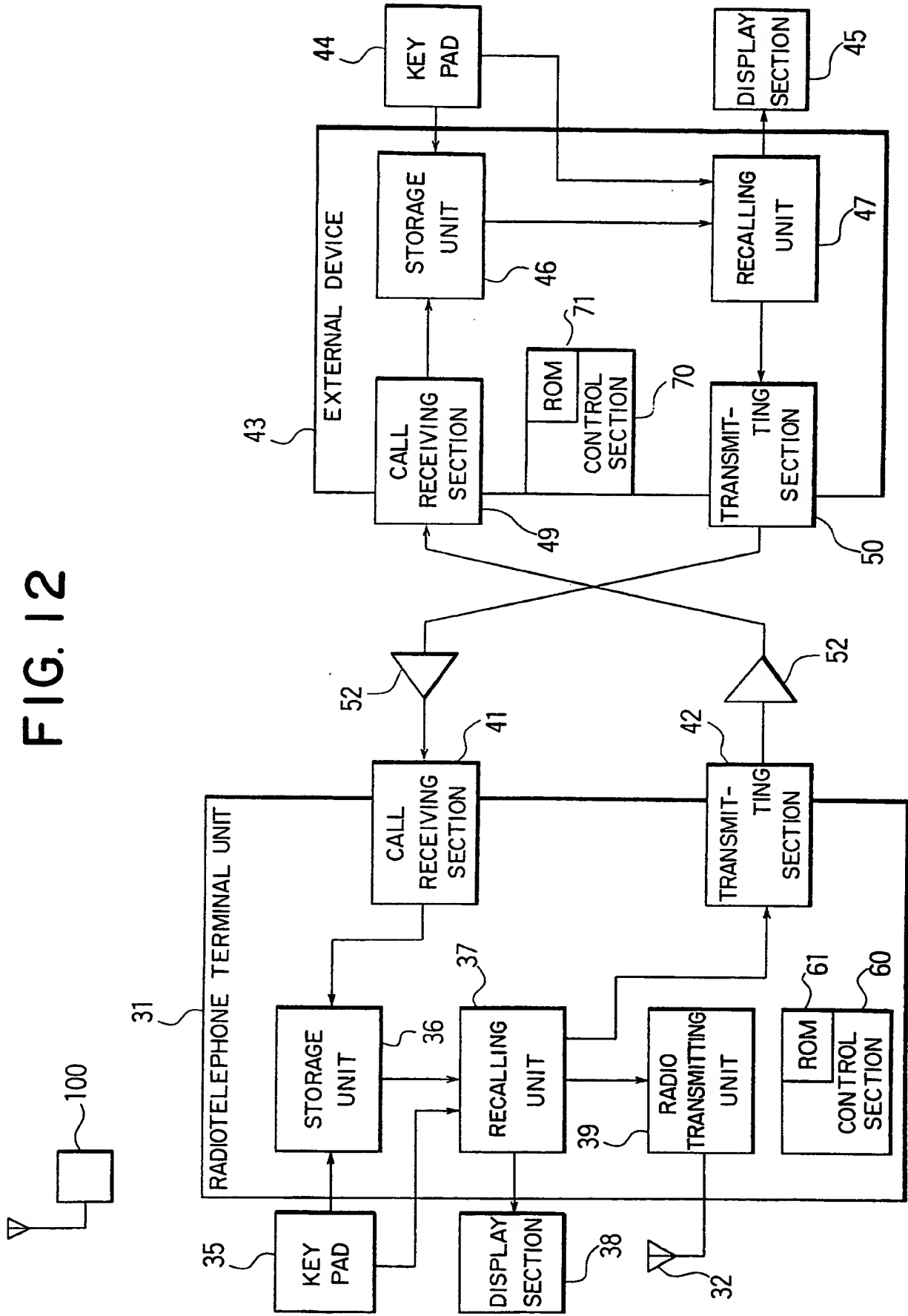


FIG. 13

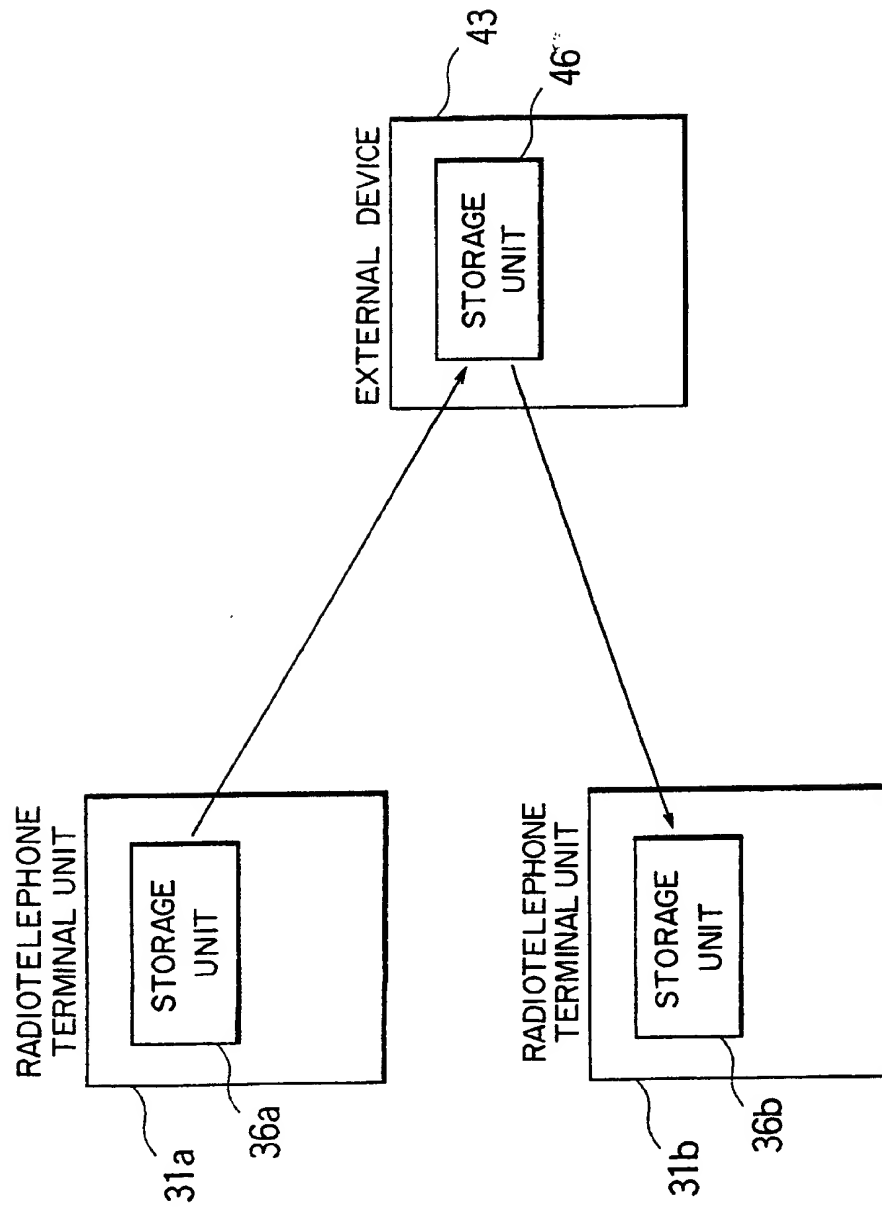
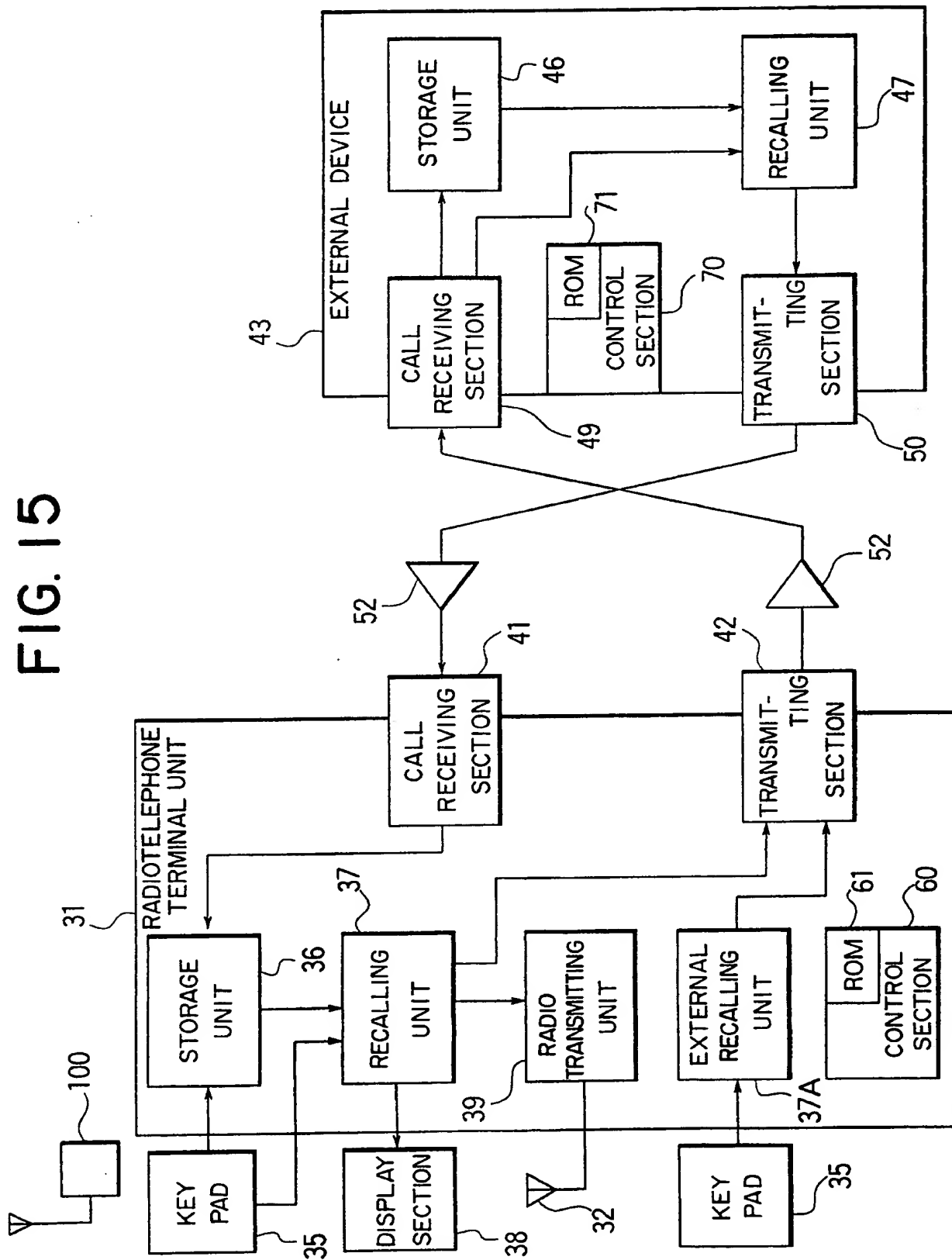
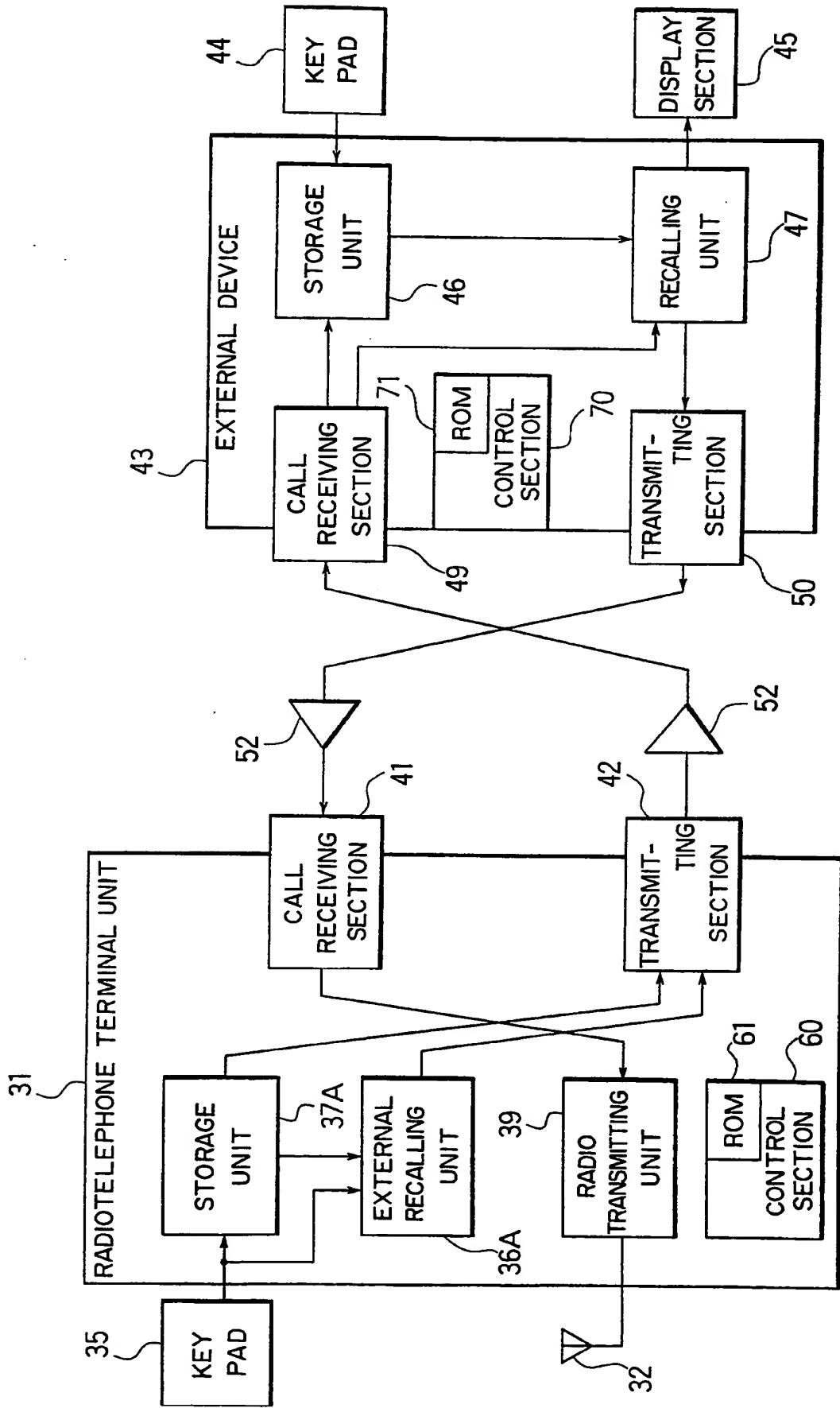
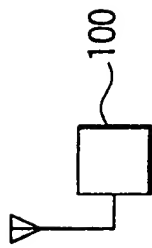


FIG. 14

The diagram illustrates a system for a radiotelephone terminal unit (31) and an external device (43). The terminal unit (31) includes a key pad (35), a storage unit (36), a recalling unit (37), a radio transmitting unit (39), a display section (38), and a transmitting section (42). The external device (43) includes a key pad (44), a storage unit (46), a recalling unit (47), and a transmitting section (50). Both units have a control section (70) with ROM (71). The diagram shows the flow of data and control signals between these components and the radio link (32).

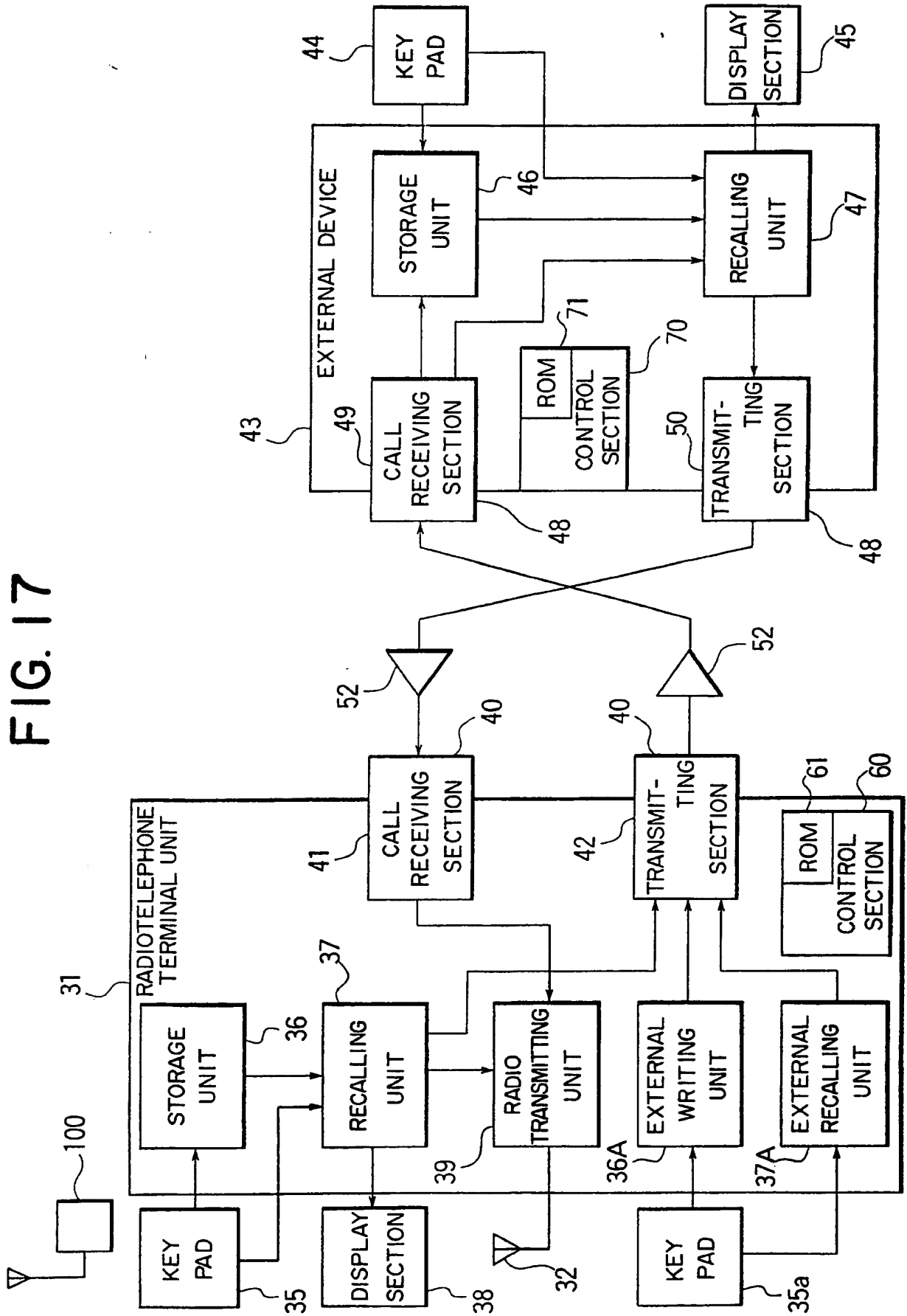
FIG. 15





16/14

FIG. 17



17/17

1 BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a radio-
telephone terminal apparatus which is used in combination
5 with an external device such as an electronic notebook
in a cellular mobile radiotelephone network or the
like.

DESCRIPTION OF THE RELATED ARTS

The conventional cellular radiotelephone ter-
10 minal unit of this type comprises a device for storing
in advance telephone numbers of subscribers as other
parties, a device for recalling said telephone numbers
of the subscribers and a device for radio transmitting
signals to a fixed base station.

15 In recent years, there has been an increasing
number of terminal units which can store telephone
numbers of about 100 subscribers, and there have also
been developed terminal units which can store subscriber
names abbreviated within a few characters corresponding
20 to these subscriber telephone numbers.

Fig. 1 is a block diagram showing the schematic
configuration of the prior-art cellular radiotelephone
terminal unit described above. In Fig. 1, 1 designates
a main body of a radio telephone terminal unit which is

1 used to carry out radio communication with a fixed
base station 14 through an antenna 2.

21 designates a storage unit for storing
subscriber information in the radiotelephone terminal
5 unit 1. For example, the storage unit 21 can store
telephone numbers and names of 100 subscribers.

22 designates a recalling unit which is pro-
vided in the radiotelephone terminal unit 1 to recall
subscriber information stored in the storage unit 21,
10 and 23 designates a radio transmitting unit or a call
originating unit provided in the radiotelephone terminal
unit 1 to radio-transmit subscriber information that
has been read out by the recalling unit 22 to the
fixed base station 14 through the antenna 2.

15 The operation of the above prior-art example
will be explained next. Subscriber information including
telephone numbers and names of subscribers are stored
in the storage unit 21 of the radiotelephone terminal
unit 1. Any desired part of subscriber information out
20 of the above subscriber information stored in the memory
unit 21 is read out by the recalling unit 22, and the
corresponding telephone number is transmitted to the
fixed base station 14 through the antenna 2 to carry out
a radio transmission by the radio transmitting unit
25 23.

In recent years, there have been widely used
portable storage units called electronic notebooks
which store personal data such as addresses, names,

1 telephone numbers, etc. of persons. A user of an
electronic notebook who also uses the radiotelephone
terminal unit 1, in most cases, will store in this
electronic notebook an excess portion of their subscriber
5 information which exceeds the storage capacity of the
storage unit 21 of the radiotelephone terminal unit 1.

In general, this is partly because of a larger
memory capacity of the electronic notebook than the
storage capacity of the storage unit 21 of the radio-
10 telephone terminal unit 1.

Since the above-described conventional cellular
radiotelephone terminal unit 1 is completely independent
of external devices such as, for example, the above-
described electronic notebook, it has been impossible
15 to carry out data transmissions between the storage
unit 21 of the radiotelephone terminal unit 1 and the
storage medium in the external device such as the
electronic notebook.

Therefore, when subscriber information of
20 various data including subscriber telephone number as
described above has been dividedly stored in the storage
unit 21 of the above-described conventional cellular
radiotelephone terminal unit 1 and in the storage unit
of the external device such as the electronic notebook,
25 it has been necessary to once recalled a subscriber
telephone number from the memory of the electronic
notebook and then input this subscriber telephone number
by operating the dial key of the cellular radiotelephone

1 terminal unit 1 in order to make a telephone call from
the cellular radiotelephone terminal unit 1 to a sub-
scriber whose telephone number was not able to be stored
in the storage unit 21 of the telephone terminal unit

5 1. Thus, the procedure has been very troublesome.

When it is desired to mutually replace a part
or whole of subscriber information stored in the storage
unit 21 of the above-described cellular radiotelephone
terminal unit 1 with a part or whole of subscriber
10 information stored in the storage unit of the external
device such as the electronic notebook, there has been
a problem that a user has to manually operate to indi-
vidually rewrite the content of the storage of each
device. Thus, there has been a troublesome procedure
15 involved that it is necessary to decide whether the
radiotelephone terminal unit 1 is to be operated or the
electronic notebook is to be operated.

SUMMARY OF THE INVENTION

It is an object of the present invention to
20 provide a radiotelephone terminal apparatus which
eliminates the above-described problems and which, by
being connected with an external device such as an
electronic notebook, makes it possible to originate a
call depending on a subscriber telephone number stored
25 in the external device without a dial operation.

It is another object of the present invention
to provide a radiotelephone terminal apparatus which

1 can mutually replace or rewrite subscriber information
stored in an external device with subscriber information
stored in the radiotelephone terminal apparatus and
which makes it possible to originate a call based on
5 the replaced or rewritten subscriber information.

It is still another object of the present invention to provide a radiotelephone terminal apparatus equipped with an external device having a shared memory function which pools various subscriber information that is
10 obtained by a plurality of radiotelephone terminal units or subscriber information which is obtained by a single device under different using conditions so that one optimum set of subscriber information is provided to individual radiotelephone terminal units to meet their
15 individual specific purposes.

Other objects of the present invention will be described in the following detailed explanation.

In order to achieve the above objects, the present invention provides a radiotelephone terminal
20 apparatus comprising a radiotelephone terminal unit having a transmitter and a receiver used in a cellular mobile radiotelephone network and an external device provided separately from the radiotelephone terminal units, each of the radiotelephone terminal unit and the
25 external device including an input unit for inputting subscriber information, a storage unit for storing these information, a recalling unit for selectively recalling stored content of the storage unit and a transmitting

1 unit for transferring subscriber information from the
radiotelephone terminal unit, and a transfer unit is
provided for reading the content of the storage units
of the radiotelephone terminal unit and the external
5 device respectively to transfer the recalled content from
one side to the other between these units so that the
subscriber information stored in the respective storage
units of the radiotelephone terminal unit and the
external device can be mutually rewritten, to enable
10 the radiotelephone terminal unit and the external
device to be used both in an integrated state and in a
separate independent state, by being provided with
the functions of sharing, editing, transmitting and
transferring subscriber information, and call-originating.

15 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing configuration
of a conventional radiotelephone terminal apparatus;

Fig. 2 is a block diagram showing configura-
tion of the radiotelephone terminal apparatus in a
20 first embodiment of the present invention;

Fig. 3 is a block diagram showing configuration
of the portion of the radiotelephone terminal unit of
the above embodiment of the present invention;

Fig. 4 is a perspective view showing appearance
25 of the apparatus of the same embodiment;

Fig. 5 is a configuration diagram showing
storage content of a ROM used in the same embodiment

1 of the present invention;

Fig. 6 is a block diagram showing configuration of an external device in a second embodiment of the present invention;

5 Fig. 7 is a block diagram showing configuration of the radiotelephone terminal apparatus in a third embodiment of the present invention;

Fig. 8A is an explanatory diagram showing configuration of an interface variation of the
10 radiotelephone terminal unit in the same embodiment;

Fig. 8B is an explanatory diagram of an interface variation of the external device in the same embodiment;

15 Fig. 9 is a block diagram showing configuration of the radiotelephone terminal apparatus in a further embodiment of the present invention;

Fig. 10 is a block diagram showing configuration of the radiotelephone terminal apparatus in a fifth
20 embodiment of the present invention;

Fig. 11 is a block diagram showing configuration of the radiotelephone terminal apparatus in a sixth embodiment of the present invention;

Fig. 12 is a block diagram showing an example
25 of the application according to the sixth embodiment;

Fig. 13 is a block diagram showing configuration of the radiotelephone terminal apparatus in a

1 seventh embodiment of the present invention;

Fig. 14 is a block diagram showing configuration of the radiotelephone terminal apparatus in an eighth embodiment of the present invention;

5 Fig. 15 is a block diagram showing configuration of the radiotelephone terminal apparatus in a ninth embodiment of the present invention;

Fig. 16 is a block diagram showing configuration of the radiotelephone terminal apparatus in a tenth
10 embodiment of the present invention; and

Fig. 17 is a block diagram showing configuration of the radiotelephone terminal apparatus in an eleventh embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 Figs. 2 to 5 show the configurations of the first embodiment in which the apparatus comprises a radiotelephone terminal unit 31 and an external device 43.

Referring to Figs. 2 to 4, the radiotelephone
20 terminal unit 31 is applied with the present invention, and 32 designates an antenna, 33 a transmitter for inputting a voice, and 34 a receiver for outputting a voice. The radiotelephone terminal unit 31 is used to carry out radio communications with a fixed base station
25 100 through the antenna 32.

35 designates a key pad provided in the radiotelephone terminal unit 31. The key pad 35 is used to

1 input subscriber information including a telephone
number, a name and an address of the person to be com-
municated with and to originate a call.

36 designates a storage unit made of a non-
5 volatile memory provided within the radiotelephone
terminal unit 31 to store the above subscriber informa-
tion, and 37 designates a recalling unit provided within
the radiotelephone terminal unit 31, to recall subscriber
information stored in the storage unit 36.

10 38 designates a display section for displaying
subscriber information inputted from the key pad 35.
When a call originating operation has been carried out
by the key pad 35, the display section 38 starts a radio
transmitting unit 39, converts a displayed subscriber
15 telephone number into a signal having a format corre-
sponding to the fixed base station 100, and transmits
the signal to the fixed base station 100 through the
antenna 32.

40 designates a plug-in and plug-out type
20 signal connector for carrying out communications between
the radiotelephone terminal unit 31 and the external
device 43 through a receiving section 41 and a trans-
mitting section 42.

The external device 43 is connected to the
25 radiotelephone terminal unit 31, which is an electronic
notebook in this case. Hereinafter, the external device
will be explained as an electronic notebook 43a.

44 designates a key pad provided in the

1 electronic notebook 43a, and 45 designates a display
section of the electronic notebook 43a and the display
section 45 is used to input subscriber information to
the electronic notebook 43a.

5 46 designates a storage unit provided in
the electronic notebook 43a, to store subscriber infor-
mation by the operation of the key pad 44. The storage
unit 46 is made of a nonvolatile memory, and the
subscriber information stored in this storage unit 46
10 is different from the subscriber information stored in
the storage unit 26 within the radiotelephone terminal
unit 31.

47 designates a recalling unit provided within
the electronic notebook 43a, to recall subscriber
15 information stored in the storage unit 46 by the opera-
tion of the key pad 44.

48 designates a plug-in and plug-out type
signal connector for carrying out communications between
the electronic notebook 43a and the radiotelephone
20 terminal unit 31 by a receiving unit 49 and a transmitting
unit 50.

51 designates an interface connector for
connecting the radiotelephone terminal unit 31 with the
electronic notebook 43a by the signal connectors 40 and
25 48. In the present embodiment, a full duplex start-
stop asynchronous non-procedural serial interface with
a transmission speed of 9600 baud is used.

52 designates a level converter for carrying

1 out signal level conversion for the interface 51.

60 and 70 designate control sections provided
in the radiotelephone terminal unit 31 and the electronic
notebook 43a respectively. The control sections are
5 usually made of a microcomputer to perform various
control operations for controlling the radiotelephone
terminal unit 31 and the electronic notebook 43a.

The control sections 60 and 70 include ROM's
61 and 71 respectively as their storage circuits.

10 Fig. 3 explains in detail the configuration
of the radiotelephone terminal unit 31 including
parts having functions that do not directly relate to
the present invention. In Fig. 3, 10 designates a
receiving unit for receiving a telephone call, 11
15 designates an oscillating section for providing high-
frequency signals and clock signals to each of the
radio transmitting unit 39, the receiving unit 10 and
the control section 60, 33 designates a transmitter
connected to the radio transmitting unit 39, and 34
20 designates a receiver connected to the receiving unit
10. The radio transmitting section 39 has not only the
call originating operation function but also transmitting
and receiving functions.

In other words, the radiotelephone terminal
25 unit 31 has not only the function of originating
operation of subscriber information as explained below
but also call transmitting and receiving functions with
a dial function similar to a normal car telephone set.

1 The operation of the above embodiment will be
explained below. At first, subscriber information
stored by the storage unit 46 of the electronic notebook
43a is inputted by the operation of the key pad 44
5 of the electronic notebook 43a. The subscriber informa-
tion is recalled by the recalling unit 47, then is
encoded by the transmitting unit 50 activated by the
call originating operation via the key pad 44, and is
transmitted to the interface through the communication
10 connector 48.

The subscriber information which has been
transmitted is converted into a signal level of the
radiotelephone terminal unit 31 by the level converter
52, and is decoded by the receiving unit 41.

15 A subscriber telephone number in the decoded
subscriber information is transmitted to the fixed
base station 100 through the antenna 32 by the radio
transmitting unit 39, so that the call is connected to
a called subscriber.

20 Accordingly, in originating a telephone call
of subscriber information stored in the storage unit
46 of the electronic notebook 43a, it is not necessary
to input the telephone number of the subscriber to be
called by operating the key pad 35 of the radiotelephone
25 terminal unit 31.

The radio transmitting unit 39 in the radio-
telephone terminal unit 31 has both a call originating
function based on the control data and a call originating

1 function based on a duplex multifrequency tone signal.

According to the above embodiment, the external device 43 is usually carried independently and subscriber information is inputted to it by the key pad 5 44 on occasion, and has functions of managing and retrieving. The external device 43 further has additional functions of scheduling and of wordprocessor when necessary, so that the external device is used as if an electronic notebook. When the external device 10 is connected with the radiotelephone terminal unit 31, it is possible to make a telephone call to a required person by using the subscriber information stored in the storage unit 46.

In this case, it is possible to select a 15 subscriber to whom a call is desired to be made and thus the call can be made to this subscriber from the key pad 44. Therefore, it is possible to take advantage of the merit of a large capacity of the storage unit 46, so that it is possible to avoid procedures of 20 inputting subscriber information read from the electronic notebook into the key pad again and input errors attributable to the input procedures which have been problems in the prior art.

Fig. 5 shows one example of the content stored 25 in a ROM 61. 610 designates a control program for controlling the control section 60 and the like, 620 designates a functional information storage section for storing information which regulates the operations such

1 as the display function of the radiotelephone terminal
unit 31, and 630 designates a communication protocol
storage section for storing the communication protocol
of the information exchanges between the radiotelephone
5 terminal unit 31 and the external device 43 when they
have been connected together (for example, a full-
duplex start-stop asynchronous non-procedural serial
transmission system).

A ROM 71 has a similar configuration to that
10 of the ROM 61.

The ROMs 61 and 71 may be integrated together
with the control sections 70 and 71 respectively (that
is, a one-chip structure) or they may be made in separate
chips for external fitting.

15 In the above description, the external device
43 has been assumed to be the electronic notebook 43a.
However, needless to say, other devices such as a personal
computer or a word processor may also be used as the
external device 43.

20 The displays 38 and 45 may be printers as well
as normal liquid crystal displays, LEDs, etc.

In the above embodiment, it is also possible
to read out, by the recalling unit 37, separate sub-
scriber information inputted from the key pad 35 and
25 to transmit with radio the subscriber information to
the fixed base station 100 through the radio transmitting
unit 39 in a similar manner.

Fig. 6 shows the configuration of the second

1 embodiment of the present invention, in which 43b designates an external device having function of receiving a selecting information and most of the configuration of the external device is the same as that of the external
5 device in Fig. 2. 45a designates a display, 46a a storage unit, 47a a recalling unit, 80 a selecting information receiving section having a pager receiving function, 50a a transmitting section for transmitting the output of the radiotelephone terminal unit 31A
10 and the recalling unit 47a, 70a control section and 71a ROM. The above configuration makes it possible to carry out an automatic call origination from the radiotelephone terminal unit 31 by using a subscriber telephone number received by the selecting information receiving
15 section 49, instead of the key pad, as an input unit for inputting a telephone number and others as subscriber information to the storage unit 46a. The configuration also makes it possible to carry the external device 43a as an individual pager unit. In the case of the present
20 embodiment, the storage unit 46a may not necessarily have a large capacity.

The external device 43b may also be applied in a sixth embodiment to be described later. Needless to say, both the key pad and the pager may be used as
25 the input unit of the external device 43.

Fig. 7 shows the configuration of the third embodiment of the present invention, which is the same as the configuration of Fig. 2, except that a transfer

1 unit is provided for connecting the output of the
recalling unit 37 of the radiotelephone terminal unit
31 to the storage unit 46 of the external device 43 through
the level converter 52.

5 The above configuration is provided with two
transfer units of opposite direction; the first transfer
unit directed from the radiotelephone terminal unit 31
to the external device 43, and the second transfer unit
directed from the external unit 43 to the radiotelephone
10 terminal unit 31.

 According to the above configuration, it is
possible to rewrite or replace a part or the whole of
the subscriber information (second subscriber information)
stored in the storage unit 46 of the external device
15 with a part or the whole of the subscriber information
(first subscriber information) stored in the storage
unit of the radiotelephone terminal unit, in addition
to carrying out the operation of the first embodiment.
Any desired portion of the rewritten second subscriber
20 information can be recalled by the recalling unit 47
by operating the key pad 44 and the read portion of
the information can be transferred to the radio transmitting
unit 39 by the second transfer unit so that a telephone
call can be made to the fixed base station 100.

25 The first subscriber information can be recalled
by the recalling unit 37 by inputting the key pad 35
when the radiotelephone terminal unit is used as a single
unit so that a call can be originated by the radio

1 transmitting unit 39.

Based on the above configuration, subscriber information of relatively low frequency of use among the subscriber information collected by the radiotelephone terminal unit 31 may be once pooled in the large capacity of memory in the external device 43. When it becomes necessary to use part of the subscriber information pooled in the external device 43, the external device 43 is connected to the radiotelephone terminal unit 31 to search the necessary subscriber information to make it possible to originate a call from the radiotelephone terminal unit 31. In general, when a person carries a portable telephone set having a memory function with him or her together with or separate from a plurality of devices such as electronic notebooks, it is troublesome to remind which device stores the necessary subscriber information, and it tends to confuse in his or her memories. Such a problem can be eliminated if the external device is used as a main memory bank.

20 Figs. 8A and 8B show variations of the configuration of the interface 51, and Fig. 8A shows an example of the case where a level converter 52a is accommodated in the radiotelephone terminal unit 31 and Fig. 8B shows an example of the case where the level converter 52a is accommodated in the external device 43. Having the level converter 52a accommodated in either the radiotelephone terminal unit 31 or the external device 43 has an advantage that the level converter 52a

1 does not interfere the operation of the radiotelephone
terminal unit 31.

Fig. 9 shows the configuration of the fourth
embodiment of the present invention, which is the same
5 as the configuration of Fig. 7, except that the storage
unit 36 is not provided within the radiotelephone
terminal unit 31, but instead, an external recalling
unit 37A is provided to convert the code of selecting
information inputted by the key pad 35a, the transfer
10 unit transfers the code-converted information to the
external device 43 to read subscriber information stored
in the external device 43, and then the second transfer
unit transfers the read information back to the radio
transmitting unit 39 of the radiotelephone terminal
15 unit 31 so that a call is originated by the radio trans-
mitting unit 39 to be transmitted to the fixed base
station 100.

According to the above configuration, a
storage unit is not required to be provided inside the
20 radiotelephone terminal unit 31, so that the structure
becomes simple. Further, when the external device 43
is connected to the radiotelephone terminal unit 31,
it becomes possible to transmit subscriber information
stored in the external device 43.

25 Fig. 10 shows the configuration of the fifth
embodiment of the present invention, which is the same
as the configuration of Fig. 9, except that the key
pad 35a and the external recalling unit 37A are provided

1 to the radiotelephone terminal unit 31 and the key pad
44 and the display section 45 are omitted from the
external device 43.

According to the above configuration, it is
5 not possible to input subscriber information from the
external device 43. However, it becomes possible to
input selecting information from the key pad 35a, to
transfer the information to the external device 43
through the external recalling unit 37A so as to read
10 the content of the storage unit 46 by the recalling
unit 47, and to transfer the read information to the
radio transmitting unit 39 so that a call is originated
by the radio transmitting unit 39 for transmission to
the fixed base station 100. Further, it is possible
15 to write subscriber information in the storage unit
by using the key pad 35, the storage unit 36 and the
recalling unit 37 of the radiotelephone terminal unit
31. It is not possible to exchange subscriber informa-
tion of the storage unit 36 with subscriber information
20 of the external device 43. However, it is possible
to originate a call by the operation of the key pad 35
through the recalling unit 37 and the radio transmitting
unit 39.

As explained above, since the external device
25 43 has no input and display unit, the external device
43 becomes compact with an increased convenience of
portability, so that it can be used as a memory card,
for example.

1 Fig. 11 shows the configuration of the sixth
embodiment of the present invention, which is the same
as the configuration of Fig. 2, except that the output
of the receiving section 41 of the radiotelephone terminal
5 unit 31 is inputted to the storage unit 36 instead of
the radio transmitting unit 39.

 According to the above configuration, it is
possible to retrieve a single or a plurality of subscriber
information from the external device 43 by using the
10 recalling unit 47 which is operated by the key pad 44,
and to transfer the retrieved information to the storage
unit 36 of the radiotelephone terminal unit 31 so that
the content can be renewed.

 In the present embodiment, the renewed sub-
15 scriber information stored in the storage unit 36 is
recalled by the recalling unit 37 which is operated
by the key pad 35 and is then transferred to the radio
transmitting unit 39.

 According to the above-described configuration,
20 a salesman, for example, may have limited subscriber
information necessary for his business contact of the
day selectively retrieved out of the subscriber infor-
mation from the storage unit 46 of the external device
43 and transfer the retrieved information to the radio-
25 telephone terminal unit 31 so that the salesman may
carry only the radiotelephone terminal unit 31 for his
business contact.

 Fig. 12 shows the configuration of the seventh

1 embodiment of the present invention, which is the same
as the configuration of Fig. 7, except that the output
of the receiving section 41 is inputted to the storage
unit 36 instead of the radio transmitting unit 39.

5 According to the above configuration, in
addition to the operation of the third embodiment, the
radiotelephone terminal unit 31 and the external device
43 can mutually rewrite the stored content of the storage
units 36 and 46 from the other side respectively.

10 Accordingly, the first subscriber information
stored in the radiotelephone terminal unit 31 and the
second subscriber information stored in the external
device 43 can be alternatively renewed to the other
information. Furthermore, as shown in Fig. 13, it is
15 possible to exchange subscriber information of a radio-
telephone terminal unit 31a and another radiotelephone
terminal unit 31b with the external device 43 as a
mediator. In this case, it is possible to avoid
manually inputting vast subscriber information from the
20 key pad.

 In the present embodiment, a serial interface
of a sufficiently high speed rate of 9600 baud is used
for the interface 51. Therefore, in the case of trans-
ferring information of 100 persons, including 10
25 characters of name per person, 32 digits of telephone
number per person and 30 characters of address per
person, for example, it is possible to update all the
subscriber information stored in the radiotelephone

1 terminal unit 31 in about six seconds, or to read all the
subscriber information from the radiotelephone terminal
unit 31 in about six seconds.

Fig. 14 shows the configuration of the eighth
5 embodiment of the present invention, which is the same
as the configuration of Fig. 7, except that, in addition
to the configuration of Fig. 7, a key pad 35a for
inputting selecting information and an external recalling
unit 37A for converting codes are provided to the
10 radiotelephone terminal unit 31.

Therefore, according to the above configura-
tion, it is possible to read subscriber information
stored in the storage unit 46 of the external device
43, from the side of the radiotelephone terminal unit.

15 Fig. 15 shows the configuration of the ninth
embodiment of the present invention, which is the same
as the configuration of Fig. 14, except that the input
and display units of subscriber information are omitted
from the external device 43.

20 According to the above configuration, the
first subscriber information stored in the storage
unit 36 is transferred to the storage unit 46 of the
external device 43 as the shared memory by using the
first transfer unit, to substitute the second subscriber
25 information stored in the storage unit 46 with the first
subscriber information. Then, selecting information
provided by the key pad 35 is converted into codes
and transferred to the recalling unit 47 through the

1 second transfer unit. A part of the subscriber information which is desired to be read out from the second subscriber information into the storage unit 36 is transferred to the recalling unit 47 is read out according
5 to the converted codes in the recalling unit 47 and transferred to the storage unit 36 through the first transfer unit so as to renew the first subscriber information with the selected subscriber information. As described above, although the external device 43
10 does not have input and display units, it is possible to edit and exchange subscriber information by using the external recalling unit 37A. Further, it is also possible to structure the external device 43 in a compact size.

15 Fig. 16 shows the configuration of the tenth embodiment of the present invention, in which, in addition to the configuration of Fig. 15, an external writing unit is provided which comprises a code conversion unit for rewriting the content of subscriber information
20 stored in the storage unit 46 with subscriber information sent from the key pad 35a (this may be shared with the key pad 35) and a level conversion unit (when necessary).

According to the above configuration, it is
25 possible to transfer the first subscriber information inputted from the key pad 35a of the radiotelephone terminal unit 31 through the second transfer unit to the external device 43 to directly rewrite the second

1 subscriber information stored in the external device
43 with the first subscriber information, and it is
also possible to read out the content of the subscriber
information stored in the storage unit 46 based on
5 selecting information inputted from the key pad 35a,
and transfer the read information to the radio transmit-
ting unit 39 by using the first transfer unit so that a
call is originated by the radio transmitting unit 39.

Fig. 17 shows the configuration of the eleventh
10 embodiment of the present invention which, in addition
to the configuration of Fig. 7, is provided with a
key pad 35a, and an external writing unit 36A and an
external recalling unit which generate or code-convert
write signals and external recall signals in accordance
15 with the input of the key pad 35a respectively.

The present embodiment has the most complex
configuration comparing with the other embodiments.
However, it is possible to input subscriber information
to the external device 43 and to recall necessary subscriber
20 information from the external device 43, from either of
the radiotelephone terminal unit 31 and the external
device 43. Further, it is also possible to mutually
renew subscriber information stored in the storage units
of the radiotelephone terminal unit 31 and the external
25 device 43 with each other.

CLAIMS

1. A radiotelephone terminal apparatus transmitting a selected subscriber information to a fixed base station, comprising:

a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network having a fixed base station;

an external device provided separately from said radiotelephone terminal unit; and

transfer means selectively connected with said radiotelephone terminal unit and said external device,

said radiotelephone terminal unit including an antenna and radio transmitting means for transmitting subscriber information through the antenna,

said external device including input means for inputting subscriber information and selecting information, storage means for storing subscriber information inputted by said input means, and recalling means for recalling subscriber information stored in said storage means in accordance with selecting information inputted by said input means and providing an output,

said transfer means transferring the output of said recalling unit from said external device to said radio transmitting means of said radiotelephone terminal unit, and said radio transmitting means transmitting with radio said subscriber information selected in accordance with selecting information to the fixed

base station through said radio transmitting means.

2. A radiotelephone terminal apparatus according to Claim 1, wherein said input means includes a selective call receiver for receiving message from a pager system.

3. A radiotelephone terminal apparatus according to Claim 2, wherein said subscriber information is a subscriber telephone number included in the received message of said selective call receiver.

4. A radiotelephone terminal apparatus, comprising:
a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radio-telephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing said first subscriber information, first recalling means for selectively recalling content of information stored in said first storage means, and radio transmitting means for transmitting subscriber information through the antenna,

said external device including second input means for inputting second subscriber information, second storage means for storing inputted second subscriber information, and second recalling means for recalling the content of information stored in said second storage means,

said radiotelephone terminal apparatus further comprising, between said external device and said radiotelephone terminal unit, first transfer means for transferring an output of said first recalling means from said radiotelephone terminal unit to said second storage means of said external device, and second transfer means for transferring an output of said second recalling means from said second storage means of said external device to said radiotelephone terminal unit,

thereby to transfer said first subscriber information to said second storage means through said first transfer means, and to transfer said second subscriber information from said radiotelephone terminal unit to said radio transmitting means through said second transfer means, to make it possible to exchange said first and second subscriber information, so that said first subscriber information that has been rewritten can be transmitted to a fixed base station through said radio transmitting means.

5. A radiotelephone terminal apparatus, comprising:

a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting selecting information to specify subscriber information to be

selected, external recalling means for carrying out a code conversion of selecting information that has been inputted, and radio transmitting means for originating a call to a fixed base station through the antenna,

said external device including second input means for inputting subscriber information, storage means for storing subscriber information that has been inputted, and second recalling means for recalling the content of information stored in said storage means,

said radiotelephone terminal apparatus further comprising, between said external device and said radiotelephone terminal unit, first transfer means for transferring an output of said external recalling means from said radiotelephone terminal unit to said second storage means of said external device, and second transfer means for transferring an output of said second recalling means from said external device to said radiotelephone terminal unit,

thereby to transfer said selecting information inputted by said first input means to said second recalling means, so as to recalling subscriber information designated by said selecting information among subscriber information stored in said second storage means and to transfer said recall information to said radio transmitting means of said radiotelephone terminal unit, so that a call can be originated to a fixed base station through said radio transmitting means.

6. A radiotelephone terminal apparatus, comprising:

a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing subscriber information inputted by said first input means, first recalling means for selectively recalling content of information stored in said first storage means, second input means for inputting selecting information to specify subscriber information to be selected, external call means for carrying out a code conversion of selecting information that has been inputted, and ratio transmitting means for transmitting subscriber information through the antenna,

said external device including second storage means for storing second subscriber information, and second recalling means for recalling the content of information stored in said second storage means,

said radiotelephone terminal apparatus further comprising, between said external device and said radiotelephone terminal unit, first transfer means for transferring an output of said first recalling means to said second storage means of said external device and for transferring an output of said external

call means to said second call means, and second transfer means for transferring an output of said second recalling means from said external device to said radiotelephone terminal unit,

thereby to transfer said first subscriber information to said second storage means through said first transfer means to rewrite said second subscriber information, and transfer said rewritten second subscriber information to said radio transmitting means through said second transfer means, so that a call can be originated by said radio transmitting means for transmission to a fixed base station.

7. A radiotelephone terminal apparatus according to any one of Claims 1, 4, 5 and 6, wherein said first input means is key input means.

8. A radiotelephone terminal apparatus according to any one of Claims 1, 4 and 5, wherein said second input means is key input means.

9. A radiotelephone terminal apparatus according to any one of Claims 1, 4, 5 and 6, wherein said first and second transfer means respectively comprise a radio transmitting section, a call receiving section, a transmission medium, a level converter provided between said radio transmitter and said call receiver to carry out a level conversion between signal levels for said radio transmitting section and said call receiving section, and transfer control means for controlling said transfer.

10. A radiotelephone terminal apparatus according to Claim 9, wherein said transfer control means includes in said radiotelephone terminal unit and said external device respectively a control section and a storage circuit having stored therein in advance a communication protocol necessary for said transfer.

11. A radiotelephone terminal apparatus according to Claim 9, wherein said level converter is accommodated in said radiotelephone terminal unit.

12. A radiotelephone terminal apparatus according to Claim 9, wherein said level converter is accommodated in said external device.

13. A radiotelephone terminal apparatus, comprising:
a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radio-telephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing first subscriber information inputted by said first input means, first recalling means for recalling the content of information stored in said first storage means, and radio transmitting means for transmitting recalled subscriber information through the antenna,

said external device including second input means for inputting second subscriber information,

second storage means for storing second subscriber information inputted by said second input means, and second recalling means for recalling the content of information stored in said second storage means in accordance with selecting information inputted by said second input means,

said radiotelephone terminal apparatus further comprising, between said radiotelephone terminal unit and said external device, transfer means for transferring an output of said second recalling means from said external device to said first storage means of said radiotelephone terminal unit,

thereby to transfer subscriber information of said second storage means selected by said second input means to said first storage means through said transfer means to rewrite the content of information stored in said storage means, recall said rewritten first subscriber information by said first recalling means and input said recalled information to said radio transmitting means, so that said radio transmitting means can originate a call for transmission to a fixed base station.

14. A radiotelephone terminal apparatus according to Claim 13, wherein said second input means includes a selective call receiver for receiving message from a pager system.

15. A radiotelephone terminal apparatus according to Claim 14, wherein said subscriber information is a telephone number of a subscriber included in a received

message of said selective call receiver.

16. A radiotelephone terminal apparatus according to Claim 13, wherein said first input means and said second input means are shared.

17. A radiotelephone terminal apparatus, comprising:
a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing subscriber information inputted by said first input means, first recalling means for selectively recalling the content of information stored in said first storage means, and radio transmitting means for transmitting recalled subscriber information through the antenna,

said external device including second input means for inputting second subscriber information, second storage means for storing inputted second subscriber information, and second recalling means for recalling the content of information stored in said second storage means,

said radiotelephone terminal apparatus further comprising, between said external device and said radiotelephone terminal unit, first transfer means for transferring an output of said first recalling means

from said radiotelephone terminal unit to said second storage means of said external device, and second transfer means for transferring an output of said second recalling means from said second storage means of said external device to said first storage means of said radiotelephone terminal unit,

thereby to transfer said first subscriber information to said second storage means and to transfer said second subscriber information to said first storage means, to make it possible to rewrite said first and second subscriber information respectively, and then to recall again the content of rewritten information in said first storage means by said first recalling means and input said recalled information to said radio transmitting means so that said recalled information can be transmitted to a fixed base station.

18. A radiotelephone terminal apparatus, comprising:

a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing said inputted first subscriber information, first recalling means for recalling the content of information stored in said first storage means, second input means

for inputting selecting information to specify subscriber information to be selected, external recalling means for carrying out a code conversion of inputted selecting information, and radio transmitting means for transmitting recalled subscriber information through the antenna,

said external device including third input means for inputting subscriber information, second storage means for storing inputted subscriber information, and second recalling means for recalling the content of information stored in said second storage means,

said radiotelephone terminal apparatus further comprising, between said external device and said radiotelephone terminal unit, first transfer means for transferring outputs of said external recalling means and said first recalling means respectively from said radiotelephone terminal unit to said second storage means and said second recalling means of said external device, and second transfer means for transferring an output of said second recalling means from said external device to said first storage means of said radiotelephone terminal unit,

thereby to transfer said selecting information inputted by said first input means to said second storage means, to recall subscriber information designated by said selecting information among subscriber information stored in said second storage means by said second recalling means, to transfer said recall information

to said storage means, and to recall said rewritten first subscriber information by said first recalling means, so that said recall information can be transmitted to a fixed base station by said radio transmitting means.

19. A radiotelephone terminal apparatus, comprising:

a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information and selecting information for specifying subscriber information to be selected, first storage means for storing said first subscriber information inputted by said first input means, first recalling means for selectively recalling the content of information stored in said first storage means, external recalling means for code converting of recalled selecting information, and radio transmitting means for transmitting recalled subscriber information through the antenna,

said external device including second storage means for storing second subscriber information, and second recalling means for recalling the content of information stored in said second storage means,

said radiotelephone terminal apparatus further comprising, between said external device and

said radiotelephone terminal unit, first transfer means for transferring outputs of said first recalling means and said external call means respectively to the outputs of said second storage means and said second recalling means respectively of said external device, and second transfer means for transferring an output of said second recalling means from said external device to said radiotelephone terminal unit,

thereby to transfer said first subscriber information to said second storage means through said first transfer means, to rewrite said second subscriber information, to select specific information out of said rewritten second subscriber information, to input said rewritten first subscriber information that has been recalled by said first recalling means to said radio transmitting means, so that a call can be originated by said radio transmitting means for transmission to a fixed base station.

20. A radiotelephone terminal apparatus according to any one of Claims 13, 17, 18 and 19, wherein said first input means is key input means.

21. A radiotelephone terminal apparatus according to any one of Claims 13, 17, 18 and 19, wherein said second input means is key input means.

22. A radiotelephone terminal apparatus according to any one of Claims 13, 17, 18 and 19, wherein said first and second transfer means comprise respectively a radio transmitting section, a call receiving section,

a transmission medium, a level converter provided to carry out a level conversion between said radio transmitting section and said call receiving section, and transfer control means for controlling said transfer.

23. A radiotelephone terminal apparatus according to Claim 22, wherein said transfer control means includes in said radiotelephone terminal unit and said external device respectively a control section and a storage circuit having stored therein in advance a communication protocol necessary for said transfer.

24. A radiotelephone apparatus according to Claim 22, wherein said level converter is accommodated in said radiotelephone terminal unit.

25. A radiotelephone apparatus according to Claim 22, wherein said level converter is accommodated in said external device.

26. A radiotelephone terminal apparatus, comprising:
a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information and selecting information for specifying subscriber information to be selected, external writing means for converting said inputted first subscriber information, into a formatted information

adapting to be written in storage means, external recalling means for carrying out a code conversion of inputted selecting information, and radio transmitting means for transmitting subscriber information through the antenna,

said external device including second input means for inputting second subscriber information, storage means for storing inputted second subscriber information, and recalling means for recalling the content of information stored in said storage means,

said radiotelephone terminal apparatus further comprising, between said radiotelephone terminal unit and said external device, first transfer means for transferring an output of said external writing means of said radiotelephone terminal unit and an output of said external recalling means respectively to said storage means of said external device and said second recalling means, and second transfer means for transferring an output of said recalling means from said external device to said radio transmitting means of said radiotelephone terminal unit,

thereby to transfer said first subscriber information inputted by said first input means to said storage means to rewrite the content of said second subscriber information, to recall subscriber information selected by said selective information out of said rewritten second subscriber information by said recalling means, and to transfer said recalled subscriber information to said radio transmitting means, so that a call can be

transmitted by said radio transmitting means for transmission to a fixed base station.

27. A radiotelephone terminal apparatus according to Claim 26, wherein said first input means is key input means.

28. A radiotelephone terminal apparatus according to Claim 26, wherein said second input means is key input means.

29. A radiotelephone terminal apparatus according to Claim 26, wherein said first and second transfer means respectively comprise a radio transmitting section, a call receiving section, a transmission medium, a level converter provided to carry out a level conversion between said radio transmitting section and said call receiving section, and transfer control means for controlling said transfer.

30. A radiotelephone terminal apparatus according to Claim 29, wherein said transfer control means includes in said radiotelephone terminal unit and said external device respectively a control section and a storage circuit having stored therein in advance a communication protocol necessary for said transfer.

31. A radiotelephone apparatus according to Claim 29, wherein said level converter is accommodated in said radiotelephone terminal unit.

32. A radiotelephone apparatus according to Claim 29, wherein said level converter is accommodated in said external device.

33. A radiotelephone terminal apparatus, comprising:
a radiotelephone terminal unit having a transmitter and a receiver, used in a cellular mobile radiotelephone network; and

an external device provided separately from said radiotelephone terminal unit,

said radiotelephone terminal unit including an antenna, first input means for inputting first subscriber information, first storage means for storing said first subscriber information that has been inputted, first recalling means for recalling the content of information stored in said first storage means, second input means for inputting second subscriber information and selecting information for specifying subscriber information to be selected, external writing means for converting said inputted second subscriber information into a formatted information adapting to be written in storage means, external recalling means for carrying out a code conversion of said selecting information that has been inputted, and radio transmitting means for transmitting subscriber information through the antenna,

said external device including third input means for inputting third subscriber information, second storage means for storing inputted third subscriber information, and second recalling means for recalling the content of information stored in said third storage means,

said radiotelephone terminal apparatus further

comprising, between said radiotelephone terminal unit and said external device, first transfer means for transferring outputs of said first recalling means, said external writing means and said external recalling means respectively from said radiotelephone terminal unit to said storage means of said external device, and second transfer means for transferring an output of said second recalling means from said external device to said radio transmitting means of said radiotelephone terminal unit,

thereby to select an output from said first recalling means and said external writing means, to transfer said output to said second storage means to rewrite the content of said third subscriber information, to recall subscriber information selected by said selecting information by said second recalling means, and to transfer said recalled information to said radio transmitting means, so that a call can be originated by said radio transmitting means for transmission to a fixed base station.

34. A radiotelephone terminal apparatus according to Claim 33, wherein said first input means and said second input means are shared.

35. A method of radio transmitting from a radiotelephone terminal apparatus comprising a radiotelephone terminal unit having a transmitter and a receiver and used in a cellular mobile radiotelephone network, and an external device provided separately from said radiotelephone terminal unit and used separately from said

radiotelephone terminal unit in usual, the method including the steps of:

inputting subscriber information to first storage means by first input means both provided in said radiotelephone terminal unit and to second storage means by second input means both provided in said external device respectively;

connecting a pair of bidirectional transfer means between said radiotelephone terminal unit and said external device to use them as an integrated unit;

transferring mutually said subscriber information stored in said first and second storage means between each other storage means by said bidirectional transfer means to rewrite contents of mutual information stored;

transferring one of subscriber information in said storage means that have been rewritten to radio transmitting means provided in said radiotelephone terminal unit; and

transmitting said subscriber information to a fixed base station through said radio transmitting means in any state of said integrated state and a separated state.

36. A method of radio transmitting from a radiotelephone terminal apparatus according to Claim 35, wherein, said radiotelephone terminal unit and said external device are provided respectively with a control section for controlling the operation of said respective

devices, and a storage circuit connected to said control section and storing in advance a communication protocol which is necessary for mutually transferring said subscriber information, thereby to carry out transfer of said subscriber information.

37. A radiotelephone terminal apparatus substantially as hereinbefore described with reference to and as shown in Figs. 2 to 5, or Fig. 6, or Figs. 7 and 8, or Fig. 9, or Fig. 10, or Figs. 11 and 12, or Fig. 13, or Fig. 14, or fig. 15, or Fig. 16 or Fig. 17 of the accompanying drawings.

38. A method of radio transmitting from a radiotelephone terminal apparatus substantially as hereinbefore described.

Patents Act 1977
Examiner's report to the Comptroller under
section 17 (The Search Report)

-45- Application number

9121435.3

Relevant Technical fields

(i) UK Cl (Edition K) H4K: KBNA; KBNJ; KYR; KYX

(ii) Int Cl (Edition 5) H04M; H04Q

Search Examiner

A C STRAYTON

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

8 MARCH 1992

Documents considered relevant following a search in respect of claims

ALL

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	EP 0450550 A2 Column 5, line 30 - column 7, line 23	1,3,4,5, 6,7,8,13, 17,18,19, 20,21,26, 33
X	EP 0206391 A2 Column 3 lines 9-13	ditto
X	US 4805211 Column 3 lines 39-44	ditto

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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